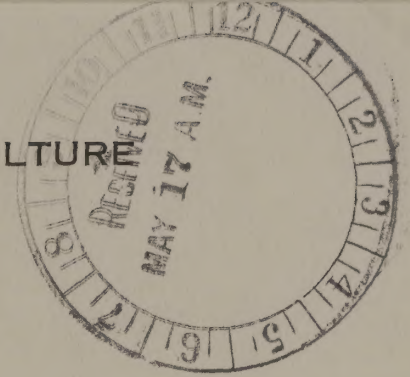


UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
SOUTHERN REGION
1700 S. W. 23RD DRIVE
P. O. BOX 14565
GAINESVILLE, FLORIDA 32604



May 15, 1974

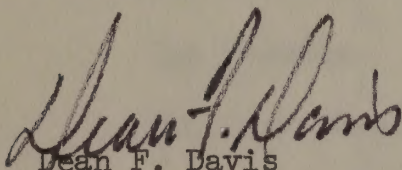
Subject: Congressional Investigative Report of Pilot Tests

To: J. W. Snow
Location Leader
Screwworm Research Laboratory
Mission, Texas

Enclosed are appropriate pages from the Hearings of the Subcommittee on Appropriations, House of Representatives, on the agricultural appropriations for 1975. These pages are taken from a report prepared by an investigative team authorized by the Chairman of the Subcommittee. The report was dated February 21, 1973.

This report is now public information as the Hearings have been published. The status of the St. Croix pilot test will be viewed as described in this report although it expresses some of your opinions at the time you were interviewed. As I understand it, these viewpoints are not the viewpoints you held at the conclusion of your assignment on St. Croix. Since probably I will have numerous opportunities to respond to the results of the program as expressed in this Congressional investigative report, I would appreciate it very much if you could give me your updated view on the conclusions stated in this report. Finally, I would appreciate receiving your overall final conclusions of the success or failure of the pilot test on Heliothis zea.

I realize that in time publications will be available which will document the results of the test. In the meantime, however, I need to have your opinions on the viewpoints presented in this Congressional report.


Dean F. Davis
Area Director

Enclosure

cc:
H C Cox
P. D. Lingren

USDA - ARS - SE
P.O. Box 167 Kingshill
St. Croix, U.S.V.I. 00850

July 10, 1974

SUBJECT: Transfer Requests of Inventoried Items
From ARS, Kingshill, St. Croix, USVI

TO: Dean Davis
Area Director
USDA ARS Southern Region - Florida Antilles Area
P.O. Box 14565, Gainesville, Florida 32604

In previous discussions with you via telecon, I have requested or indicated to you requests received from various places for several inventoried and non-inventoried items that are in excess to the needs of the current program on St. Croix.

The items requested are as follows:

Dr. Peter D. Lingren:

1. Machine Calc. Manora Elec.	S-841682
2. Radio, GE - 2 way	199171
3. Radio, GE - 2 way	199172
4. Cabinet (Insect control type)	194149

Dr. Alton Sparks:

1. Laminar flow - clean work sta.	S-7497
2. Laminar flow - clean work sta	198190
3. Machine filling and capping loz cups	203164

Dr. Wendell Snow:

1. 1/4 ton IHC Scout (possible need)	V-16527
2. 10 Ten amp. electric grid traps	non-inventory
3. 1 hourly internal light trap	Non-inventory

Dr. Jim Coppedge:

1. 10 Bl. traps	non-inventory
-----------------	---------------

Jim Stanley:

1. 80 Ten amp electric grid traps	non-inventory
-----------------------------------	---------------

Dr. Norm Lepple:

1. Excess <u>Heliothis</u> diet materials	non-inventory
2. Any excess lepidopterous rearing equipment such as blenders, scales, etc.	

I have discussed all of my needs with you and Dr. Patterson and he is in

(continued)

Dr. Dean Davis
Transfer Requests of Inventoried, etc.
continued pgs 2

agreement with the transfer of items requested. The capping machine will be transferred to Dr. Sparks. His other request for Laminar flow clean work station will be held in limbo until local project needs are established.

I have not discussed the vehicle that Dr. Snow may need with anyone because I was not sure of his desires or the local needs. He will contact you in the event that he decides on a need for the vehicle. The other items requested by Snow are in excess of local needs and have been approved for shipment by you and Dr. Patterson at Dr. Snow's expense.

The same is true for the black lights requested by Dr. Coppedge.

The grids requested by Mr. Stanley are in excess of local needs but we are awaiting shipment instructions from him because of possible budget restrictions.

The excess Heliothis diet materials will be shipped to Dr. Leppla at his expense. To date, I have not discussed Dr. Leppla's other needs with Dick, but will do so in the next few days and Dick will contact Norm should he have an excess of any of the desired items.

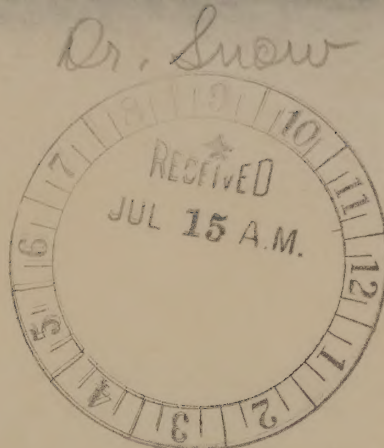
Fifty four days to the world left behind.

Pete D. Lingren

Peter D. Lingren
Research Entomologist

CC: Dr. Patterson
Dr. Sparks
✓ Dr. Snow
Dr. Coppedge
Dr. Leppla
Mr. Stanley

file cc's



July 12, 1974

Mr. Gerald Blackman
Veterinary Entomology Unit
Wellcome Research Laboratories
(Berkhamsted)
Berkhamsted, Herts.
England HP4 2QE

Dear Mr. Blackman:

Your letter of June 20 was forwarded to me from Mission, Texas, as I am now back in Kerrville. It is not easy to reply because I am not entirely certain that escapes from a screwworm colony at Berkhamsted would be harmless to English livestock. Although Cochliomyia hominivorax is definitely tropical and subtropical in its distribution and only invades regions north of 30° N. latitude in the summer, I doubt that anyone can be certain that escaped flies would not survive and reproduce in England during the warmer months of the year. We know that the adult flies are not killed by overnight minima as low as 22°F. Cool nights such as those that commonly occur in Central Texas in the fall and early winter ordinarily prolong adult life, and gravid females seek hosts during the day if the temperature rises above about 60°F. Egg masses and newly hatched larvae are protected from cold by the body heat of the host animal, and wintertime screwworm infestations are occasionally seen in Texas north of the 30th parallel.

Apparently the principal climatological limitation to screwworm reproduction is the effect of cold on the pupae. The species does not seem to have any diapause capability, and pupae do not survive if the pupal period is prolonged beyond about 60 days. Parman (1945) found that pupae held at fairly constant temperatures near 55°F rarely produce adults, but that the lowest average daily mean air temperature at which pupae survived was 47.6°F (the minimum was 17°F). When cold prolongs the pupal period beyond 40 days, the percentage of emergence drops rapidly, and only rarely do more than 1 or 2% emerge after 50 days of pupation. The longest recorded pupal period was 77 days.

Pupal survival is also strongly influenced by soil moisture. Parman found that the species rarely survives in areas that receive more than 5 in. of rainfall per month and in no area that receives more than 4 in. of a slow,

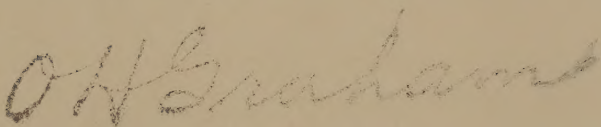
continuous type of rainfall. Bruce (1939) reported 92-98% adult emergence from pupae held in soils with 0 to 13% water but that emergence declined to 80% at 14.3% water content and zero at 16.1% water content. These data are compatible with field observations of poor screwworm survival in regions characterized by very wet soils. I am not sufficiently familiar with the climate of southern England to know whether or not temperature and rainfall could be depended upon to prevent completion of the screwworm life cycle, but I would point out that screwworm epizootics occurred in states as far north as Iowa and South Dakota before the current eradication program was initiated in the United States.

The screwworm colonies at Mission are maintained under rigid quarantine by the Animal and Plant Health Inspection Service of USDA, and to obtain live materials from these colonies you would need to obtain a permit from that agency. I suggest that you correspond with Dr. D. L. Williams at the address below if you decide to pursue that approach:

Dr. D. L. Williams
Chief Staff Officer for
Screwworm Eradication
USDA-APHIS-Veterinary Services
Federal Center Building
Hyattsville, Maryland 20782

If I can be of any additional assistance to you, please do not hesitate to write again.

Sincerely,



O. H. Graham
Research Entomologist

cc:

D. L. Williams
W. J. Snow
R. O. Drummond
R. Everett

continuous type of rainfall. Bruce (1939) reported 93-98% adult emergence from pupae held in coffee with 0 to 1% water but that emergence declined to 80% at 14.3% water content and zero at 16.1% water content. These data are compatible with field observations of poor sawfly survival in regions characterized by very wet soils. I am not sufficiently familiar with the climate of southern England to know whether or not temperature and rainfall could be depended upon to prevent completion of the sawfly life cycle, but I would point out that sawfly epizootics occurred in states as far north as Iowa and South Dakota before the current eradication program was initiated in the United States.

The sawfly colonies at Mission are maintained under rigid quarantine by the Animal and Plant Health Inspection Service of USDA, and to obtain live material from these colonies you would need to obtain a permit from that agency. I suggest that you correspond with Dr. D. L. Williams at the address below if you decide to pursue that approach:

Dr. D. L. Williams
Chief Staff Officer for
Sawfly Eradication
USDA-APHIS-Veterinary Services
Federal Center Building
Huntsville, Maryland 20782

If I can be of any additional assistance to you, please do not hesitate to write again.

Sincerely,

G. H. Graham
Research Entomologist

cc:
B. L. Williams
W. J. Snow
R. O. Drummond
R. Everett

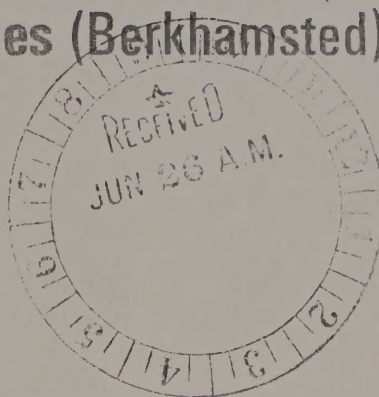
ack To
Aug 5

Wellcome Research Laboratories (Berkhamsted)

Berkhamsted Hill, Berkhamsted, Herts, England HP4 2QE

Departments of Veterinary Science and Entomology Tel. Berkhamsted 5681
Departments of Chemistry and Product Registration Tel. Berkhamsted 3333

Our Ref: GGB/MFH
Your Ref:



Wellcome

cables & telegrams
Tabloid Berkhamsted
telex 825477

20th June, 1974.

Dr. O. H. Graham,
Entomology Research Division,
MISSION,
TEXAS 78572,
U.S.A.

Dear Dr. Graham,

We would like to set up at these Laboratories a colony of the screw worm fly, Cochliomyia homnivorax for research purposes. I understand from my colleague, Mike Matthewson, whom you met last November in Texas, that you breed them in great numbers at Mission.

To obtain the necessary import licence, we have first to assure our Ministry of Agriculture that the screw worm would not become established in Britain, should escapes occur. I would be grateful therefore if you could supply me with details of the climatic and geographical distribution of the screw worm, stressing in particular the point that the climate in Britain, even in summer, would be quite unsuitable for the fly to become established.

We have adequate facilities for maintaining Dipteran cultures with temperature and humidity controlled breeding rooms with fly-proof doors.

On receipt of the necessary import documents I shall then write to you again, and, if you are able to supply them, ask for screw worm pupae to be sent by airmail.

I look forward to hearing from you,

Yours sincerely,

A handwritten signature in cursive script that reads "Gerald Blackman".

Gerald Blackman
Veterinary Entomology Unit

INTERNATIONAL WOOL SECRETARIAT

Headquarters Wool House · Carlton Gardens London SW1Y 5AE · 01-930 7300 · Cables Sanzasec Telex London · Telex 263926

Dr Pierre Chehaloux,
US Department of Agriculture,
Animal & Plant Health Inspection Service,
Hyattsville,
Maryland 2782,
USA

14th August, 1974

Dear Dr Chehaloux,

Hourrigan
Schubert

~~Klingsporn~~
Knowles

2 Williams
Gartman
Mathis
Scoe

SCREW WORM

A mutual friend of ours, Mr Alistair Harkness, Veterinary Advisor to the New Zealand High Commission in London, has suggested I write to you on the subject referred to above.

The Secretariat has recently had enquiries from India regarding the control of Screw Worm incident to sheep in that country. Our enquirer explains that though they undertake topical treatment after the infection is detected and take preventative precautions in the form of housing sheep in fly-proof sheds throughout the high morbidity period during monsoon, there continues to be considerable production loss. The enquiry made of us is specifically as to whether there have been or are being developed any systemic means of prevention either via the sheep or the fly itself.

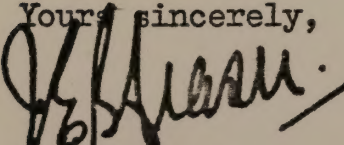
I would be most grateful if you could find time to better inform us on the most recent forms of treatment and prevention and where on-going research, UK and elsewhere, into this problem is being undertaken.

In replying you may prefer to write direct to the source of our enquiry:

Mr B K Kedia,
The RAYMOND Woollen Mills Ltd.,
J K Buildings,
N. MORARJEE MARG,
Ballard Estate,
Bombay, India.

If you decide this is the best course of action, I would be grateful if you would copy me any correspondence which passes directly between you and India on this matter.

Yours sincerely,


Mr IEB Fraser,
Manager,
Wool Handling Department.

c.c. Mr K C Clarke, Managing Director, IWS
Mr A Harkness, Veterinary Adviser to NZ High Commission



LOCKHEED ELECTRONICS COMPANY, INC.
AEROSPACE SYSTEMS DIVISION

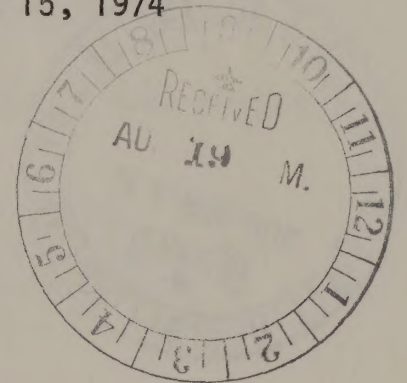
16811 EL CAMINO REAL

HOUSTON, TEXAS 77058

TELEPHONE (AREA CODE 713) 488-0080

August 15, 1974

Dr. J. Wendell Snow
Screwworm Research Laboratory
P.O. Box 986 Moore Air Base
Mission, Texas 78572



Dear Dr. Snow,

Thank you for your letter concerning the screwworm fly literature review. Enclosed is the Technical Memorandum of the review. Due to some suggestions by an entomologist in our group, a few changes were made in the report.

Since Dr. Henderson has agreed to let us have the old reports from Dallas and Menard, we would appreciate having them sent to us first. We will then send all the reports to him once our work is completed.

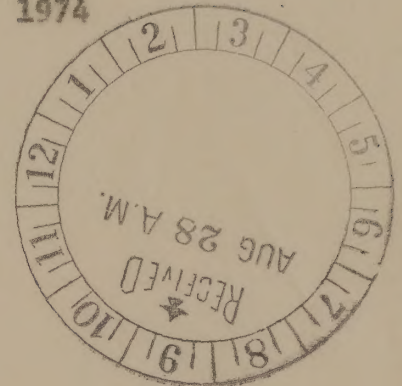
Thank you again for your hospitality during my visit to Mission. I must say that the tour of the fly factory will be an experience I soon won't forget!

Sincerely,

Morgan S. Gibson
Scientist Associate

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
VETERINARY SERVICES
FEDERAL CENTER BUILDING
HYATTSVILLE, MARYLAND 20782

August 23, 1974



Dr. IEB Fraser
International Wool Secretariat
Wool House, 6/7 Carlton Gardens
London, England
SW1Y 5AE

Dear Dr. Fraser:

Dr. Pierre Chaloux referred your letter of August 14, 1974, regarding
screwworms in India to us for reply.

We have taken the liberty of forwarding your letter to Dr. Wendel Snow,
Research Leader, who is in charge of screwworm research at the
Agricultural Research Service Laboratory in Mission, Texas.

You can expect a reply from Dr. Snow promptly.

Sincerely,

A. L. Klingsporn
Acting Senior Staff Veterinarian
Sheep, Goats, Equine, and
Ectoparasites Staff

cc:

Dr. Lyman Henderson, Beltsville, Maryland
✓ Dr. Wendel Snow, Mission, Texas
Dr. A. L. Klingsporn, Hyattsville, Maryland

APHIS:VS:DWilliams:kmc 8/23/74

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
VETERINARY SERVICES
FEDERAL CENTER BUILDING
HYATTSVILLE, MARYLAND 20782

August 23, 1974



Dr. IEB Fraser
International Wool Secretariat
Wool House, 6/7 Carlton Gardens
London, England
SW1Y 2AR

Dear Dr. Fraser:

Dr. Pierre Gauthier referred your letter of August 14, 1974, regarding
serosystems in India to us for reply.

We have taken the liberty of forwarding your letter to Dr. Wendel Snow,
Research Leader, who is in charge of serosystem research at the
Agricultural Research Service Laboratory in Mission, Texas.

You can expect a reply from Dr. Snow promptly.

Sincerely,

A. L. Klingborn
Acting Senior Staff Veterinarian
Sheep, Goats, Equine, and
Pest Diseases Staff

cc:
Dr. Lyman Henderson, Beltsville, Maryland
Dr. Wendel Snow, Mission, Texas
Dr. A. L. Klingborn, Hyattsville, Maryland

APHIS:VS:DWI:ams:mc 8/23/74

164 East School
Dugway, Utah 84022
17 Feb 75

Dr. J. L. Snow
Head of the
ARS
POB 986
Mission, TX 78572

Dear Dr. Snow:

Thank you for your letter and for accepting the phone call last week. I have reviewed Jones' manuscript and made a number of comments. It is enclosed.

I have enclosed a rough draft copy of a manuscript I hope can be published. Make whatever changes you deem necessary. I appreciate any help you can give me to get this and other screwworm research manuscripts published. I am not sure which journal might accept such a mixture of entomology, gas chromatography, IR spectrophotometry, and mass spectrometry. I'm open for suggestions.

I will begin rewriting my other 2 manuscripts using this one as the leading publication. The others were written with the assumption that our scientific note would be published.

Thanks again for any assistance you can give me.

Sincerely,

Rolland R. Grabbe
Rolland R. Grabbe

Enclosures



For Comment to Snow
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
NATIONAL PROGRAM STAFF
Beltsville, Maryland 20705

✓ EAT —
✓ WFS —
— JE —
— NC —

March 5, 1975

Subject: MRRL Program of Research on Cochliomyia hominivorax

To: Milt Ouye, PACS

Transmitted herewith is my only copy of the subject report which was developed by Gerald Holt at my request. This report shows that an 8-man multidisciplinary team of ARS and SAES scientists has been assembled at Fargo. The end objectives of this effort are to:

- (1) provide various kinds of attractants (oviposition, sex, etc.) for detection, assessment, and possibly suppression of screwworm populations, and
- (2) provide a radar system for tracking the movement of individual screwworms in nature.

I recommend that if additional funds are made available for screwworm research, a reasonable percentage of such funds be allocated to MRRL. I am confident that this team will come through for us. Also, I feel that this involvement in an internationally significant problem will tend to assure the role of MRRL as a "National laboratory."

Please return the subject document when you no longer need it.

Waldemar Klassen

Waldemar Klassen
Staff Scientist
Pest Management

Enclosure

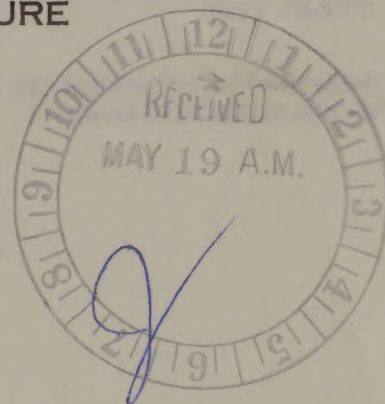
cc:
L. S. Henderson
H C Cox
E. A. Taylor ✓
C. H. Schmidt

RECEIVED

MAR 10 1975

AREA OFFICE
WESLACO, TEXAS

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
METABOLISM AND RADIATION RESEARCH LABORATORY
STATE UNIVERSITY STATION
FARGO, NORTH DAKOTA 58102



May 14, 1975

Dr. J. Wendell Snow, Leader
Screwworm Research Laboratory
P. O. Box 986 (Moore Air Base)
Mission, Texas 78572

Dear Wendell,

I want to express our thanks and gratitude to you and your staff for the many courtesies shown us during our visit last week. Both Terry and I agree that it was time well spent. I am sure that future cooperation is will be established and will be of mutual benefit to both our laboratories as well as to APHIS.

I mentioned to Fred Proshold that you might call him, and he seemed receptive. So, if you are interested in pursuing the matter, call him.

We have received our "Budget News" for this year -- no money for screwworm research at Fargo.

I processed the black and white film of the Ranch -- still waiting for the color. I will make a composite copy and send it on to you when I get the rest of the slides back.

I sent Jim Whitten som of Ian McDonald's reprints together with a publications list from both Entomology Sections. I am sure that Jim will be welcome to spend some time with those scientists sharing common interests here at Fargo if and when it is decided to do so.

Again, thanks from both Terry and me.

Best regards,

A handwritten signature in dark ink, appearing to read "G. Holt".

Gerald G. Holt, Research Biologist
Insect Metabolism and Physiology Section

cc: T. S. Adams

RECEIVED AUG 23 1976



ICI United States Inc.

WILMINGTON, DELAWARE 19897
(302) 575-3000

ANIMAL HEALTH DEVELOPMENT DEPARTMENT
PHARMACEUTICALS GROUP

August 20, 1976

Dr. J. Wendell Snow
USDA - ARS
Screw-Worm Research
P. O. Box 968
Mission, TX 78572

Dear Wendell:

I very much enjoyed visiting you last week and seeing round your experimental facilities. I must agree that "The Factory" is certainly worth a visit.

Many thanks for your hospitality and for the time you put aside to answer my many questions.

Kindest regards,

Gavin

Gavin B. Braithwaite
Veterinarian/Entomologist

GBB:lf

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Screwworm Research Laboratory
P. O. Box 986
Mission, Texas 78572

September 7, 1976

Subject: Trip Report, Curacao, NA, August 18-28, 1976

To: J. Wendell Snow, Research Leader

Harold Tannahill and I arrived in Curacao about 8:30 PM, on Wednesday, August 18. We were met at the airport by Alberto Broce (who had preceded us by one day to assemble the various traps previously shipped), and Peter Gorsira. We were informed that Dr. R. Gorsira wanted to meet with all the American delegation as early as possible the next day.

The next morning, A. Broce, H. Tannahill, P. Gorsira, and I met with Dr. R. Gorsira, Head of Veterinary Services. Dr. Gorsira explained that the program to eradicate the screwworm from Curacao had been assigned to the Curacao Veterinary Services; and, consequently, he was the official on Curacao responsible for the coordination of this program. Dr. Gorsira requested that we outline our plan of action for Curacao and wanted to know who from the SRL would be involved during this project and what their involvement would be. Dr. Gorsira prepared 2 outlines from these discussions (see pages 4 and 5).

During the meeting, Dr. Gorsira brought us up to date on the screwworm problem in Curacao. There had been only one additional human case since May when we first visited Curacao, and the number of cases in animals had dropped considerably. He attributed this improvement to a greater awareness of the problem by the people and widespread use of Co-Ral spray bombs. He said that, during the past two weeks, there had been an increase in the number of animal cases reported; however, he felt this was a result of the intensive publicity and field inspection campaigns initiated by the group trained at Mission on their return to Curacao. He gave many examples of the extent of concern by the citizens of Curacao over this problem, one of which I feel is worth relating. About one week prior to our visit, a fly was found in a local bank which was thought to be a screwworm fly from pictures someone had seen on television and in the

newspapers. Consequently, the bank was evacuated until a member from the Veterinary Service went out, determined that the fly was not a screwworm, and killed it.

Also, during the Thursday morning meeting, Dr. Gorsira indicated that we would be interviewed and photographed on several occasions during our stay by public relations people from the Curacao government. He suggested at this time that we channel all requests from the news media for information concerning this project through him; we fully agreed with this suggestion. Thursday afternoon, we began to put out the screwworm traps.

On Friday, we completed placing the traps in the field. We deployed 14 standard traps baited with Swormlure-2, 6 standard traps baited with liver, 10 directional traps baited with Swormlure-2, and 4 Bishopp-type traps baited with Swormlure-2. While we were deploying the traps at one site, we were interviewed and photographed by persons from the Curacao Public Relations Department. The interview was shown on local television that night at 9 PM, and the photograph and a news article appeared in the local paper the following day (see page 6). This news story stressed to the public the importance of not bothering the traps, because they are part of a program to eradicate this pest from Curacao, and because the attractant used in the traps was dangerous.

On Monday, August 23, we inspected the traps for the first time: 7 screwworm flies were captured. All the flies were captured in traps baited with Swormlure-2. The directional trap captured more screwworm flies than the standard trap. All except one fly was captured west of Willemstadt.

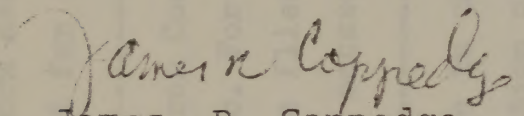
On Tuesday, H. Tannahill, P. Gorsira, and I secured the services of a private single engine airplane and flew over the Island for approximately one hour. We felt that this air tour was interesting and would be quite helpful in future planning of this research project. On Tuesday afternoon, H. Tannahill, A. Broce, Dr. R. Gorsira, P. Gorsira, and I met with Mrs. Maria Liberia Peters, Deputy Minister (Dr. Gorsira's boss). We discussed our plans for research on Curacao, some of the program needs, and some of the problems. A considerable amount of time was spent discussing how to get the many wandering goats on the Island inspected and, when necessary, treated. Public

relations people attended the meeting, and A. Broce and I were interviewed; the interview was shown on the news that night, and a photograph and short article appeared in the newspapers the next day (see page 7).

The traps were inspected on Wednesday and again on Friday. Seven additional screwworm flies were captured. Several of the traps were moved to different sites.

On Saturday, August 28, we returned home. The experiments which we initiated while on Curacao are being carried on by the work group there. They agreed to prepare and send a summary of results weekly. A news article appeared in the paper that Saturday, the day we left, stating that the screwworm eradication program is now in "full swing" (see page 8).

We feel that the support being provided by the Curacao Government for this project is very good. The 5 young men assigned full time to the screwworm eradication project are quite capable and enthusiastic. A new International Scout has been purchased for us on this project; and just before we left, a new pickup was ordered. A laboratory (approximately 300 sq ft) with 5 work tables and several storage cabinets has been provided for the screwworm work. Also, several square feet of storage space and shelf space in a warehouse has been allocated for our use.


James R. Coppedge
Research Entomologist

cc H. Tannahill
A. Broce
R. Gorsira

Dr. Snow - Research leader, screwworm Research Laboratory, Mission Texas. Will provide administrative support for the project as needed.

Dr. Coppedge, Entomologist - Research Coordinator of the project to eradicate the screwworm from Curacao. For this purpose use will be made of swormlure, an attractant, to lure flies to baits impregnated with an insecticide or chemosterilant and if necessary sterile fly releases.

Dr. Broce, Entomologist will be in charge of the monitoring of the population of flies and the evaluation of the methods used. The mayor tool here is swormlure baited traps.

Dr. Crystal, Entomologist will be primarily involved in the laboratory support of the project, the chemosterilant and insecticide used during the project and the lab-work on flies.

Dr. Goodenough, Agricultural Engineer, will provide engineering support where needed e.g. areal distribution system of the bait.

Mr. Tannahill and Mr. Gorsira will be responsible for the project implementation and will coordinate the work of the group trained in Mission, Texas - Mr. G. Davelaar

Mr. E. Davelaar

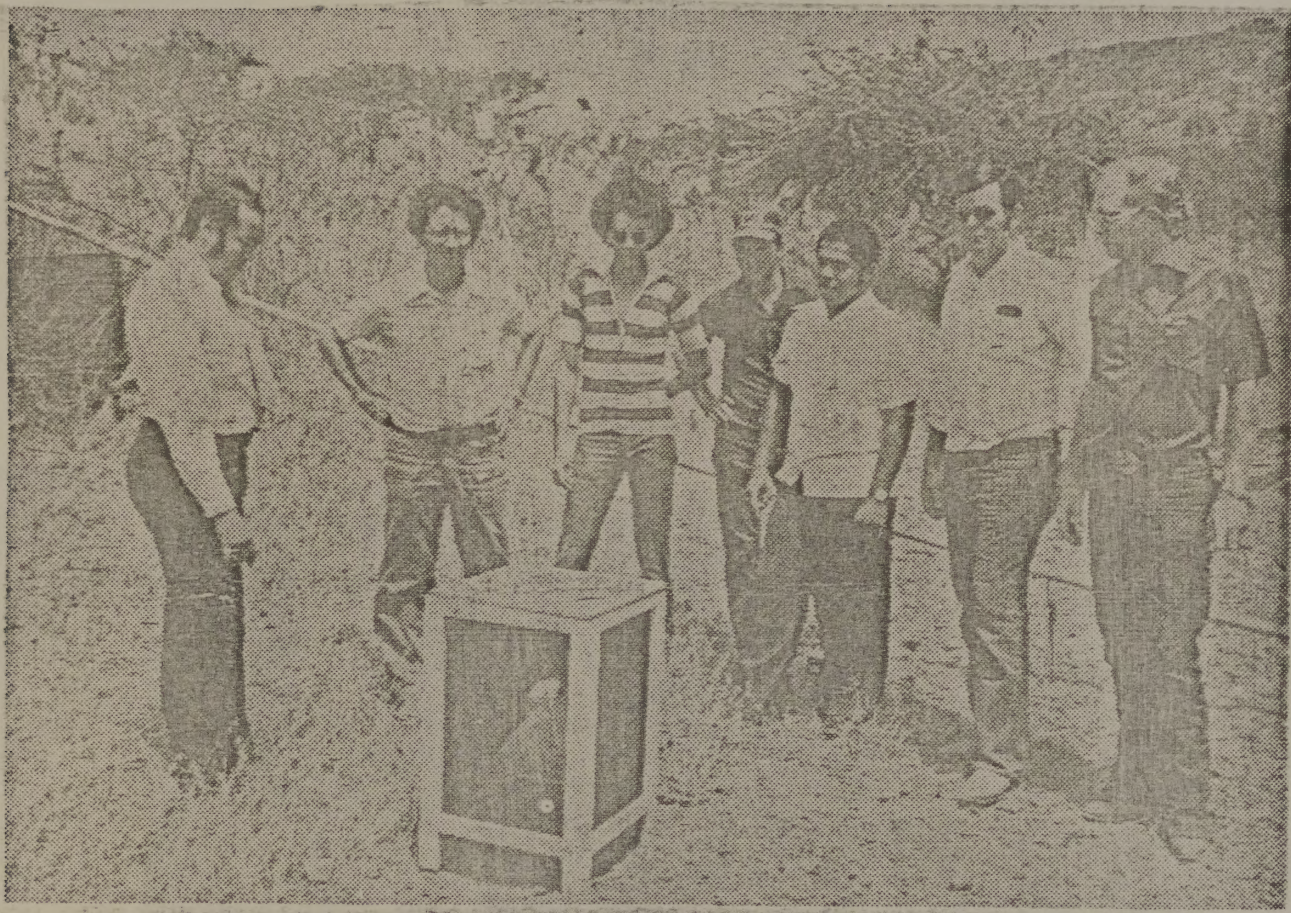
Mr. de Windt

Mr. Bicentini.

SCREWWORM ERADICATION PROJECT . PLAN OF ACTION

1. Select sites for traps
Study ecology of the area.
2. Establish the kind of trap to be used for the survey (50 - 100 traps)
3. Reconnaissance of the island by airplane for approximately one hour.
4. Placing of traps - needed 1 (one) pick-up truck.
5. Continue registration of livestock owners and checking of livestock.
Pen animals for 1 day in given area.
Government helps with feed. Continue treating infested animals.
6. In January or February mobilize a group of people to place baits in urban areas.
Approximately 10 baits per Km²

---.---



Ya e expertonan mericano cu a yega Corsow pa cuminsa combati e muskita schroefworm a pone diferente trampa na seis lugar rond Corsow.

Expertonan pa combati schroefwormvlieg a yega Corsow

WILLEMSTAD — Dos experto mericano den entomologia, dr. Coppedge y dr. Broce huntu cu señor Tanna-

hill, experto den eradicacion di schroefworm a yega Corsow e siman aki.

Nan a traha un plan di accion preliminar y ta esserá lo siguiente. Nan lo cuminsa pone dos sorto di trampa pa coge muskita na 14 sitio cu ta bini na consideracion, pa determina e cantidad di e muskita na Corsow.

Como aas nan ta usa Swormlure, un sustancia cu ta plama un olor fuerte cu ta atrae e muskita. E sustancia quimico aki ta contene un

zuur fuerte y publico ta ser suplica pa no mishi cu e trampa nan aki.

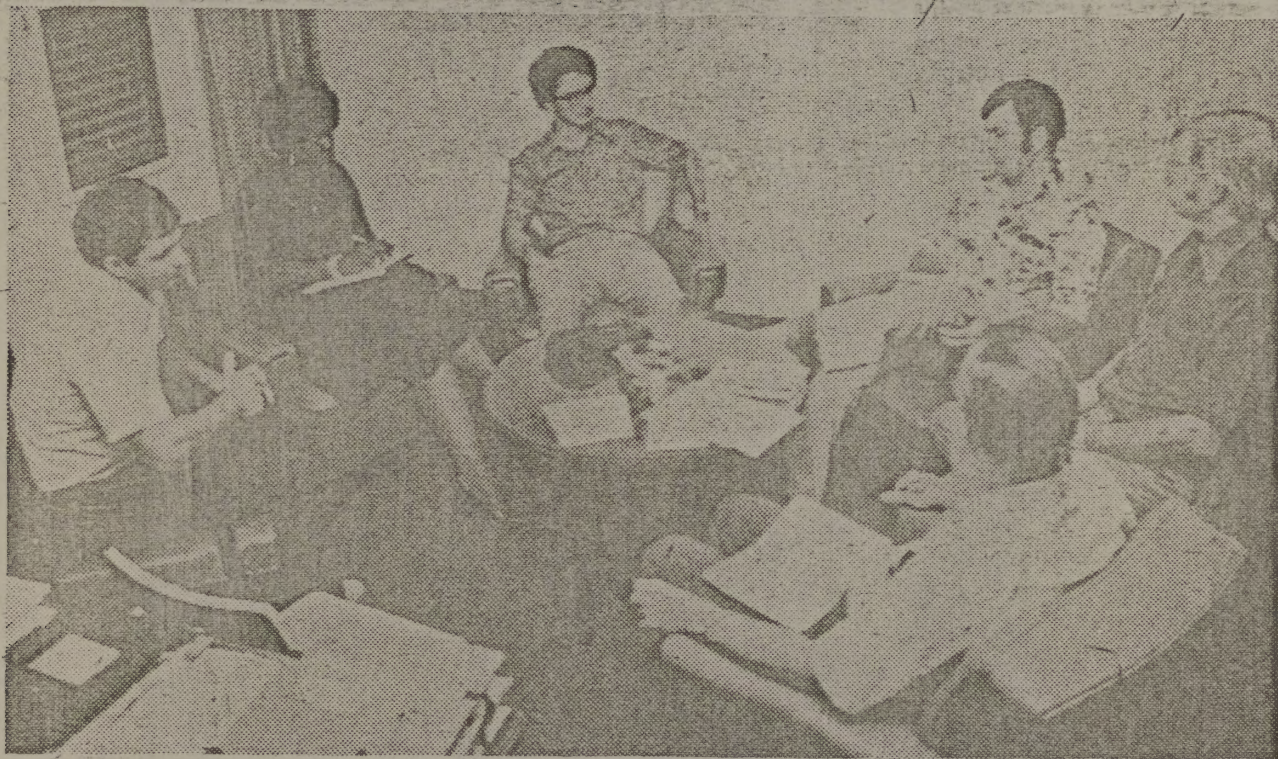
Ora cu nan obtene informacion tocante concentracion di e muskitanan, nan lo usa plachinan rondo den cual nan ta incorpora aas cu insectivide pa eradica e muskita.

For di antayera nan a pone diferente trampa na varios lugar na Corsow pero autoridadnan kier a pidi tur persona cu nota un animal cu tin schroefworm, pa yama servicio Veterinario na telefon 14000, 54360 of 55812.

PAGINA 10

NOBO

DIARASON 25 AUGUSTUS 1976



WILLEMSTAD. — Diputado Maria Liberia Peters ayera a risibi na ofisinan central di Bestuurscollege, e tres expertonan mericano cu a bini Corsow pa combati e schroefworm epidemia. Tabata presente tambe dr. Gorsira den su calidad di hefe di Servicio Veterinario. E conversacion cu e expertonan a hiba cu e diputado Liberia Peters tabata riba concentracion di e muskita schroefworm y e sistema pa combati e muskitanan. Diputado Liberia Peters a hanja un explicacion extenso di e sistema y e plan di accion.

Riba e foto por mira e grupo huntu durante e deliberacion.

èxtra

Diasabra 28 di augustus 1976



WILLEMSTAD – Manera ta conoci, for di cuminsamentu di e aña aki, Corsow tabata infestá pa e asina yama “Schroefwormvlieg”-nan y tin un campaña di erradiccion den “full swing” actualmente pa exterminashon di e muskitanan aki. Na diverso parti di Corsou nan a pone trapanan caba.

E foto cu nos ta publica aki awe, ta musta, con un cabritu a ser “ataká” pe muskitanan y por nota e cantidad enorme di webu y bichinan den partinan di e animal.

E foto aki a ser facilitá na EXTRA, pa parti di un di e mas alto autoridadnan di salubridad publica di teritorio insular di Corsou.

RECEIVED SEP 20 1976
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, D.C. 20250

September 14, 1976

Subject: Analysis of Screwworm Release Experiment

To: T. W. Edminster, ARS
F. J. Mulhern, APHIS
M. E. Meadows, APHIS
J. Wendel Snow, ARS ✓
L. S. Henderson, ARS
R. C. Bushland, ARS

The attached analysis of Dr. Krafur's report presenting results of field studies on screwworm fly release intervals is submitted for your study and consideration.

I hope the appraisal in terms of efficiency of sterile-fly releases is reasonably valid and that it will be helpful in optimizing efficiency of the screwworm program in the United States and Mexico.

E. F. Knipling

E. F. Knipling
Collaborator - Entomologist, ARS
Room 204, National Agricultural
Library
Beltsville, Maryland 20705

Enclosure

See
Co How *pendant*

Analysis of Data on Effect of Swath Width on the
Efficiency of Released Sterile Screwworm Flies

E. F. Knipling
Collaborator
Agricultural Research Service
U.S. Department of Agriculture

September 13, 1976

This is an analysis of the weekly activity report (July 9-15, 1976) by Dr. E. S. Krafur (APHIS), giving screwworm case incidence and levels of egg sterility in a test area using $1\frac{1}{4}$ mile intervals of fly releases vs. $2\frac{1}{2}$ to 5 mile release intervals for conventional releases. The results of the field releases were discussed with Dr. R. C. Bushland recently. He also supplied me with some data I had not seen.

The results of field trials of the nature conducted are subject to many variables, which makes it difficult to draw definite conclusions. However, the data presented are very impressive and indicate that the efficiency of the screwworm program can be increased substantially by narrowing the release intervals.

Perhaps the staff at Mission has already critically analyzed the results; but estimates of the efficiency of released sterile flies on the basis of the egg sterility level is not a simple matter, and the method I used may be helpful in efforts to optimize the cost-benefit factors, involving costs of fly production and costs of releasing the flies produced.

Precise estimates of relative efficiency of the released flies in the two areas cannot be made because the data do not clearly indicate the average swath width in the "control" area versus the "treated" area. Also, the precise number of flies released in the two areas is not given. Another element that makes an accurate analysis difficult is the fly dispersal factor, which will alter the actual and observed rates of sterility and, of course, also affect the relative number of screwworm cases in the two areas. However, reasonably good appraisals can be made on the basis of the data presented.

The analyses were made on the basis of the following assumption:

1. That the average fly-release interval in the "treated" area was $1\frac{1}{4}$ miles.
2. That the average fly-release interval in the "control" area was $3\frac{3}{4}$ miles.
3. That the average rate of fly release per square mile in the treated area was 1,600, as compared with 4,000 in the control area.
4. That the average rate of egg mass sterility in the treated area was 75 percent, as compared with 50 percent in the control area.

The assumption of 50 percent sterility of egg masses in the control area may actually be a conservative assumption because average sterility during the period of releases according to the data was only 47 percent. The assumption of 75 percent sterility in the treated area is closer to the recorded average of 73 percent sterility. However, it is probable that considerable numbers of sterile and fertile flies migrated from the

treated area into the control area and likewise fertile and sterile flies migrated into the treated area from the control area. Since the level of sterility in the treated area was higher than in the control area, the migration factor would tend to reduce the recorded average sterility in the treated area below the actual level and increase the recorded average sterility in the control area above the actual level. However, the assumed sterility values can be used to make a reasonably conservative estimate of the relative efficiency of the released flies in the two areas.

Relative Efficiency of Sterile Flies Assuming

That the Same Numbers Were Released in the Two Areas

If the same number of flies had been released in the two areas and if sterility in the normal swath width area was 50 percent, this would mean that the released flies were exactly equal to the wild flies in efficiency. The actual ratio of sterile-to-fertile flies was no doubt higher than 1:1 but in terms of results the effective ratio of sterile-to-fertile flies was only about 1:1.

If the sterility in the treated area was 75 percent, this would indicate that the effective sterile-to-fertile ratio was 3:1. Again, the ratio of released to wild flies was probably higher than 3:1 but they produced the effect to be expected from a ratio of 3:1.

On the basis of this comparison, the flies released at intervals of $1\frac{1}{4}$ miles were at least three times as efficient as the flies released at intervals of $3\frac{3}{4}$ miles.

Relative Efficiency of the Released Flies

in the Two Areas When Actual Numbers

Released Is Taken Into Account

The rate of release in the treated area is assumed to be 1,600 per square mile. The rate of release in the control area is assumed to be 4,000. Therefore, the release rate in the control area was 2.5 times that in the treated area. Therefore, the two factors will have to be multiplied to make an estimate of the relative efficiency of the flies in the treated and control areas. The product of $2\frac{1}{2} \times 3 = 7.5$. This is the estimated increase in efficiency of sterile flies released at intervals of $1\frac{1}{4}$ over the efficiency when the release interval is $3\frac{3}{4}$ miles.

If flies were equally efficient in the two areas and 47 percent sterility occurred at the 4,000 release rate, then one would expect about 26 percent sterility at the 1,600 release rate assuming that the natural fly densities in the two areas were comparable. Since the average sterility was 73 percent, one can conclude that there was a major difference in the efficiency of the flies in the two areas. Better distribution of released flies seems to be the principal reason.

Dispersal Behavior of Screwworm

Flies Before and After Mating

It seems probable that newly emerged flies tend to remain in a relatively limited area until after they have mated. Long-range dispersion of the screwworm fly is indicated by case incidence in livestock many miles from infested areas in a previous generation. If native flies tend to disperse long distances before mating, the chances that native males and females will be in close proximity to each other would be remote during periods of very low natural fly densities.

The significance of this hypothesis is of great importance from a practical standpoint. It means that sterile flies must be well distributed throughout an infested area to provide maximum opportunity for sterile flies to compete with wild flies when mating occurs.

Optimizing Efficiency by Making Adjustments in Funds for Costs of Distributing and Costs of Producing Flies

If it has not yet been done, it seems important that a critical analysis be made of costs of releases and costs of production in order to optimize efficiency on the basis of the assumed 7.5-fold increase in efficiency of the flies released at narrow swath intervals.

I do not know what proportion of the available funds now go into the following cost areas: (1) Cost of fly production, (2) costs of fly

releases, (3) fixed overall costs not directly related to either (1) or (2). We can make assumptions, however, in order to consider the type of adjustments that could be made to optimize efficiency. For this purpose we will assume that the costs are as follows: (1) Costs of fly production = 50 percent; (2) costs of fly releases = 25 percent; and (3) all others = 25 percent.

Thus, for a program costing \$10 million, \$5 million is expended for production; \$2.5 million for releases; and \$2.5 million for all other.

If the fly production costs were reduced to $\frac{1}{2}$ of the current level, this would represent a savings of \$2.5 million. If this savings were assigned to fly distribution costs and if this would make it possible to make releases at intervals of $1\frac{1}{4}$ miles, the fly distribution would be much more thorough. However, only $\frac{1}{2}$ the number of flies would be available for releases. It was estimated that the flies released in the narrow swath area were 7.5 times as efficient as those released in the wide swath area. Therefore, one-half the number of flies should still result in $3\frac{3}{4}$ fold increase in efficiency. This should represent a much more effective program without an increase in the overall cost of the program.

It is emphasized, however, that the above estimate is calculated on the basis of assumed costs for each of the three major cost components. The most efficient use of flies will depend on the actual costs of each major cost component.

General Considerations

It has long been my feeling that the upsurge in screwworm cases in recent years is in part or perhaps due primarily to an increase in the number of wild flies resulting from changes in animal practices and the lack of good surveillance by livestock producers.

As compared with the first few years of the program, it seems probable that there are now at least two times the number of susceptible wounds on domestic livestock in the early spring because ranchers have abandoned controlled breeding practices and they now perform more surgical operations during the fly season. Livestock owners are also less diligent in treating wounds that are man-made or which occur accidentally. If this is a valid conclusion, this factor alone might give the wild flies that are present twice the opportunity to deposit eggs on a favorable wound.

Perhaps equally, if not more important, the poor animal surveillance will permit more mature larvae to develop from the infested animals that do occur. Hence, more wild flies will be present per unit area than in the past. These two factors alone could account for several times as many wild flies now than ten years ago.

In addition to the above, the number of deer in the general screwworm infested areas has probably increased by several fold during the past ten years. This could be another factor favoring the production of wild flies. This factor plus more tick wounds may be as important as each of

the other two factors cited. Fly releases have been increased by about twofold during the past 10 years but this may not be enough to offset the fivefold to tenfold increase in wild flies. It is possible, or even probable, that we will have to increase the efficiency of the released flies by 7.5-fold in order to have the same suppression impact now that was produced in the early part of the program.

In order to make up for the adverse factors cited, there seem to be two alternatives: (1) Achieve greater efficiency with the available resources by making better distribution of released flies even at the expense of decreasing fly production, and (2) maintain present production levels but obtain an increase in funds for better fly distribution. This may be necessary to take care of the increase in numbers of wild flies because of poor animal management practices over which we now have little control.

Other causes could contribute to the increase in screwworm cases during the past 5 years but the major cause may be a simple matter of adequate ratios of sterile-to-wild flies throughout the screwworm habitats. The results of the swath width studies indicate that distribution of released flies is a factor of major importance.

It seems that progress has been made in fly quantity and in detection methods. The results of the field studies on fly distribution could be the most important lead for improvements in the regular program and to assure optimum effectiveness in the joint U.S.-Mexico program.

The other two factors cited. The release has been increased by about twentyfold during the past 10 years but this may not be enough to offset the fivefold to tenfold increase in wild birds. It is possible, or even probable, that we will have to increase the efficiency of the release lines by 5-10 fold in order to have the same representation of the release lines in the early part of the program.

In order to make up for the shorter release lines, there were to be two alternatives: (1) increase greater efficiency with the available resources by making better utilization of release lines even at the expense of decreasing the production, and (2) maintain present production levels but obtain an increase in funds for better distribution. This may be necessary to take care of the increase in number of wild birds because of poor release management practices over which we have little control.

Other reasons could contribute to the increase in release lines during the past 10 years but the major reason may be a simple matter of adequate release of birds to wild birds throughout the program.

The results of the study which indicate that about 10% of released birds is a factor of major importance.

It seems that program has been made in its entirety and in different methods. The results of the study indicate on the distribution could be the most important factor for improvement in the regular program and to secure optimum effectiveness in the joint U.S.-Mexico program.

RECEIVED DEC 2 1976

Snow

November 29, 1976

Gail

Dr. J. P. Spradbery
Division of Entomology, CSIRO
P. O. Box 6712
Boroko, Papua New Guinea
AUSTRALIA

Dear Dr. Spradbery:

Thank you for supplying me with a reprint of your recent publication on your evaluation of some screwworm smears for the control of Chrysomya bezziana. Your tests were very interesting and there is a possibility that your results will be useful to the screwworm eradication program now underway in the southwestern United States and Mexico.

The United States Department of Agriculture has never attempted to develop a smear formulation containing coumaphos but there are still situations where topical treatments for screwworm control are required and some of our livestock producers have asked about the use of coumaphos in smears. Were the smears you used in New Guinea patented and are they commercially available at the present time? I would greatly appreciate any details you can supply concerning the composition of your experimental smears.

We, in USDA, follow your work with the Old World screwworm with a great deal of interest and hope you will continue to keep us informed of your findings.

Sincerely,

O. H. Graham
Research Entomologist

cc:

D. L. Williams (with enclosure)
✓ Wendell Snow (with enclosure)

RECEIVED DEC 2 1976

November 1976

Dr. J. L. ...
Division of ...
P.O. Box ...
Boronia, New Mexico
AUSTRIA

Dear Dr. ...

Thank you for supplying me with a reprint of your recent ...
your examination of some ...
determine. Your ...
will be useful to the ...
my interest in the ...

The ...
develop a ...
in ...
generally ...
any device you can supply ...

Very ...
Sincerely,

Dr. J. L. ...
Division of ...

cc:
Dr. J. L. ...
Wendell ...

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

SOUTHERN REGION

SUBTROPICAL TEXAS AREA

P. O. Box 267

Weslaco, Texas 78596

March 16, 1977

Subject: Entomology Consultant for Subtropical Texas Area

To: E. F. Knipling, Science Adviser, Entomology
USDA, ARS, Room 205, NAL
Washington, D.C. 20250

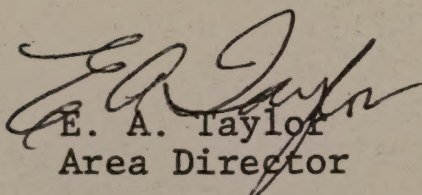
We are indeed pleased that you are able to visit the Subtropical Texas Area during the week of March 27 to consult with our scientists at Mission, Weslaco, and Brownsville. These discussions are scheduled for March 29, 30, and 31 at the above locations, respectively.

Your travel expenses for this trip will be payable from the Area Account Number 701-7201-03010. A signed travel request is enclosed for your use.

I have requested that the research leaders provide accommodations for limited numbers at each location, i.e., ARS scientists and technicians, and only APHIS workers that are involved in data collection and analysis supporting the research programs. At Weslaco and Brownsville a few Texas A&M University scientists that are actively cooperating in associated problems will be invited to attend the discussions as observers.

It would be highly desirable to hold an open discussion at Weslaco in the Texas A&M University Hoblitzelle Auditorium on March 30. This would need to be a more general type discussion on basic principles of insect population suppression and control. I believe a 1 hour presentation and 1/2 hour to respond to questions would be adequate time for this activity.

Also enclosed is an agenda for each location. These can be modified or changed as the discussions develop.


E. A. Taylor
Area Director

4 Enclosures

Edward F. Knipling

Dr. Edward F. Knipling was born in Port Lavaca, Texas, in 1909, and worked on his father's farm until he started his professional career. He received his B.S. degree from Texas A&M College in 1930, his M.S. in 1932, and his Ph.D. (in entomology) in 1947 from Iowa State University.

Dr. Knipling first worked for the Department as a field aid in the former Bureau of Entomology and Plant Quarantine in Tlahuallio, Mexico, assisting in field studies on the pink bollworm during the summer of 1930. In 1931 he was appointed as a junior entomologist to conduct research on the biology and control of the screwworm at Menard, Texas. During the next few years he conducted research on various pests of livestock in various assignments of increasing importance at Galesburg, Illinois; Ames, Iowa; Valdosta, Georgia; and Menard, Texas. In 1940 he was placed in charge of research on mosquitoes of the Northwestern States, with headquarters at Portland, Oregon.

During World War II he had the important assignment of directing the work of the Orlando, Florida, laboratory where he led in the development of DDT and other insecticides and repellents for use by the armed forces of this country and its allies in controlling the vectors of malaria, typhus, plague, and other diseases. The research at the Orlando laboratory received national and international recognition. The methods of control for the insects which transmit some of the most important diseases of man are being utilized throughout the world today.

From 1946 to 1953 Dr. Knipling directed the research on insects affecting livestock, man, households, and stored products from headquarters at Washington, D. C. During the last few months of 1953 he was Assistant Chief in Charge of Entomological Research in the Bureau of Entomology and Plant Quarantine, and following reorganization of the Department in 1953, he became Director of the Entomology Research Division, Agricultural Research Service, with headquarters at Plant Industry Station, Beltsville, Maryland. He gave overall direction to insects affecting crops such as cotton, grain, forage, fruits, and vegetables, as well as insects affecting man and animals. He served in this capacity until 1971.

In 1971 Dr. Knipling was appointed Science Adviser to the ARS Administrator. He remained in this capacity until his retirement in December 1973. Currently, Dr. Knipling is in the process of completing a publication on the basic principles of insect population suppression under a collaborator's appointment and continues as a consultant for the Agricultural Research Service and the Animal and Plant Health Inspection Service on research and control of harmful insect pests.

Dr. Knipling's entire career was centered around the continual improvement of methods for controlling injurious insects and for utilizing to fullest advantage the beneficial insects. He is the author of about 200 technical publications relating to insects. He has concentrated research efforts on more effective and more desirable ways to meet insect problems. The program which eradicated the screwworm from the Southeast was based on a concept that originated with him. In studies on the ecology, behavior, and mating habits of screwworm flies in 1938, he speculated that it might be possible to eradicate isolated infestations by overwhelming the native flies with laboratory-reared insects carrying genetic deficiencies. He later encouraged entomologists working under his supervision to determine ways of sterilizing the flies by chemical agents or by irradiation and to test the principle under laboratory conditions. End result, a new approach to insect control and even eradication due to his ingenuity and persistence in developing an idea. He took leadership in advancing research on the same principles for controlling or eradicating a number of other pests, including the pink bollworm, tropical fruit flies, codling moth, and the boll weevil.

Dr. Knipling is a strong proponent of the total population control concept or even eradication of insect populations by applying appropriate techniques against the total population in community-wide, regional, or national programs. His primary goal has been to advance biological and other alternative methods of insect control that will minimize adverse effects to the environment. He is one of the leading authorities in the field of insect population dynamics and has pointed out the great advantages to be gained by integrating different methods of control simultaneously or in sequence. He was among the first scientists to make use of simulated insect suppression models to indicate the feasibility of suppressing pest populations by the use of such techniques as sterile insects, insect sex attractants, programed releases of parasites and various combinations of techniques employed simultaneously or sequentially.

The success of his leadership and scientific accomplishments is evidenced by his having been presented the United States of America Typhus Commission Medal by the Department of Defense in 1946; the Medal for Merit, awarded by the President of the United States in 1947; and the King's Medal for Service in the Cause of Freedom, awarded by Great Britain in 1948. In addition, he was commended by the Navy Department for the research under his direction which changed the entire methodology for control of insect-borne diseases. In 1958 Dr. Knipling received the Iowa State College Alumni Merit Award. The following year he was selected one of five scientists for the Progressive Farmer Magazine Man of the Year Award for Service to Southern Agriculture. In 1960 he received the U.S. Department of

Agriculture's Distinguished Service Award and the Hoblitzelle National Award in the Agricultural Sciences (joint). He received the Ford Farming Magazine's Distinguished Service Award in 1961 and the John Scott Award the same year. In 1962 he received an honorary Doctor of Science degree from Catawba College in North Carolina, and was one of four recipients of the Texas A&M College Distinguished Alumni Awards. In December 1962 he received the Golden Plate Award of the Academy of Achievement, and in 1966 he received the Rockefeller Public Service Award. The National Medal of Science for 1966 was presented to him by President Johnson on February 6, 1967. He received honorary Doctor of Science degrees from North Dakota State University in May 1967, from Clemson University in May 1970, and the University of Florida in May 1975. In the April 1970 issue of Esquire Magazine, he was listed in Donald Robinson's "100 Most Important People in the World." On May 5, 1971, President Nixon presented him the President's Award for Distinguished Federal Civilian Service.

Dr. Knipling is a member of several scientific societies, including the Entomological Society of America (President in 1952 of the American Association of Economic Entomologists, which is now consolidated with ESA); American Association for the Advancement of Science; Washington Academy of Sciences; the Entomological Society of Washington; Sigma Xi; American Mosquito Control Association; Insecticide Society of Washington; American Society of Tropical Medicine and Hygiene; and is also a member of the National Academy of Sciences; American Academy of Arts and Sciences, and the Cosmos Club. He has served on many special committees for such organizations as the U.S. Department of Agriculture, National Research Council, Department of Defense, World Health Organization, Food and Agriculture Organization, and the International Atomic Energy Agency.

Dr. Knipling is an avid outdoorsman and enjoys hunting, fishing and hiking. His favorite sport is hunting with a bow and arrow.

Dr. and Mrs. Knipling (Dr. Phoebe H. Knipling) reside at 2623 Military Road in Arlington, Virginia. They have five children. Mrs. Knipling served as Science Supervisor in the Arlington, Virginia, secondary school system and Chairman of Science Fair Programs in the Northern Virginia Secondary Schools. She is a Ph.D. graduate of Iowa State College, having majored in protozoology and parasitology.

March 1976



SUGGESTED TOPICS - SCREWORM RESEARCH
March 29, 1977 - Mission, TX

8:30 a.m. Opening Remarks - - - - - E. A. Taylor

8:45 a.m. Discussion of Individual Progress

A. B. Broce
H. E. Brown
J. R. Coppedge
M. M. Crystal
J. L. Goodenough
C. J. Whitten

11:00 a.m. Curacao Program

Status Report - - - - - J. R. Coppedge
- - - - - A. B. Broce
- - - - - J. L. Goodenough
- - - - - M. M. Crystal

Discussion - - - - - J. R. Coppedge

2:00 p.m. Mexico Program

Status Report - - - - - C. J. Whitten
- - - - - J. E. Novy

Discussion - - - - - C. J. Whitten

3:00 p.m. General Discussion - - - - - J. W. Snow

4:15 p.m. Closing Remarks - - - - - E. F. Knipling
- - - - - E. A. Taylor

TOPICS FOR DISCUSSION - CITRUS INSECTS RESEARCH
March 30, 1977 - Weslaco, TX

Introductions and Opening Comments - - - - -E. A. Taylor

Current Activity

Citrus Blackfly in Texas
and Florida - - - - - W. G. Hart
- - - - -D. P. Harlan

Mediterranean Fruit Fly - - - - - W. G. Hart
- - - - - R. H. Rhode

Citrus Mealybug - - - - - W. G. Hart
- - - - - D. E. Meyerdirk

Aerial Sensing of Environmental
Influences on Insect Populations - - - - - W. G. Hart
- - - - -S. J. Ingle
- - - - -M. R. Davis

The Influence of Entomophages
on Citrus Insect Populations - - - - - W. G. Hart
- - - - -D. E. Meyerdirk

SUGGESTED TOPICS - COTTON INSECTS RESEARCH
March 31, 1977 - Brownsville, TX

Host Plant Resistance on Cotton - - - - -M. J. Lukefahr
- - - - - -R. H. Dilday
- - - - - -T. N. Shaver

Boll Weevil Management by

Crop Termination - - - - - D. A. Wolfenbarger
- - - - - A. A. Guerra

Pheromones and Behavior of

Tobacco Budworms - - - - - D. H. Hendricks
- - - - - J. R. Raulston
- - - - - T. N. Shaver

Microbial Toxins for Insect

Control- - - - -H. T. Dulmage
- - - - -C. Beegle

RECEIVED APR 11 1977

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
WASHINGTON, D.C. 20250

April 5, 1977

Dr. J. Wendell Snow
Leader, Screwworm Research
Laboratory, ARS USDA
P.O. Box 986
Mission, Texas 78572

Dear Dr. Snow:

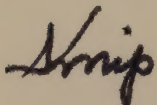
May I take this opportunity to thank you and your staff for the excellent review and discussion of the research program on screwworms that were held on March 29.

I will not attempt to highlight the most interesting aspects of the research. It seems to me, however, that excellent progress has been made in several areas, which promise to increase the efficiency of the suppression and eradication programs.

The preliminary results of the trapping program on Curacao and the research preceding the initiation of the experiment seem particularly outstanding. The availability of a more active attractant for detection should be of immediate value in the program, and may offer a useful component in suppression when the most effective formulations and trap dosages are further developed.

I wish to thank you and your staff for an interesting and informative review of the research and for the courtesies you extended to me during my visit. I hope that all of you found the discussions to be productive.

Sincerely,



E. F. Knipling
Collaborator - Entomologist, ARS
Room 204, National Agricultural
Library
Beltsville, Maryland 20705

cc:

D. A. Lindquist

*Civalah &
Vefun*

